**CHAPTER – 1**

**INTRODUCTION**

* 1. **Overview**

**Anspro Technologies** is a Bangalore based software development company with vast industry experience in various domains, services & product lines. We utilize our vast experience and expertise in developing various software solutions in accordance with our client’s business and job requirements.

**Anspro Technologies** provides cost-effective, convenient and easy-to-manage software solutions services.

We serve our clients with cost efficient software applications that helps them to grow their business. **Anspro Technologies** offers one stop solutions to our customers for their web designing, web application development & web hosting requirements. We provide e-learning applications, which have advanced features and rich graphical interface. Our e-learning applications are best suited for educational institutions, training institutes for providing distant education and training purposes. Our customized billing and accounting tool is suitable for any departmental stores as well as for small scale industries.

In the modern era of big data, retrieving useful information from a large number of textual documents is a challenging task, due to the unprecedented growth in the availability of blogs, news articles, and reports are explosive. Automatic text summarization provides an effective solution for summarizing these documents. The task of the text summarization is to condense long documents into short summaries while preserving the important information and meaning of the documents. Having the short summaries, the text content can be retrieved, processed and digested effectively and efficiently. Generally speaking, there are two ways to do text summarization: Extractive and Abstractive. A method is considered to be extractive if words, phrases, and sentences in the summaries are selected from the source articles. They are relatively simple and can produce grammatically correct sentences. The generated summaries usually persist salient information of source articles and have a good matching with human-written summaries. On the other hand, abstractive text summarization has attracted many attentions since it is capable of generating novel words using language generation models grounded on representations of source documents. Thus, they have a strong potential of producing high-quality summaries that are verbally innovative and can also easily incorporate external knowledge. In this category, many deep neural network based models have achieved better performance in terms of the commonly used evaluation measures compared to traditional extractive approaches. In this paper, we primarily focus on the recent advances of sequence-to-sequence (seq2seq) models for the task of abstractive text summarization.

**1.2 What is the Project**

In the past few years, neural abstractive text summarization with sequence-to-sequence(seq2seq) models have gained a lot of popularity. Many interesting techniques have been proposed to improve the seq2seq models, making them capable of handling different challenges, such as saliency, fluency and human readability, and generate high-quality summaries. Generally speaking, most of these techniques differ in one of these three categories: network structure, parameter inference, and decoding/generation. There are also other concerns, such as efficiency and parallelism for training a model. In this paper, we provide a comprehensive literature and technical survey on different seq2seq models for abstractive text summarization from viewpoint of network structures, training strategies, and summary generation algorithms. Many models were first proposed for language modeling and generation tasks, such as machine translation, and later applied to abstractive text summarization. Therefore, we also provide a brief review of these models. As part of this survey, we also develop an open source library, namely Neural Abstractive Text Summarizer (NATS) toolkit, for the abstractive text summarization. An extensive set of experiments have been conducted on the widely used CNN/Daily Mail dataset to examine the effectiveness of several different neural network components. Finally, we benchmark two models implemented in NATS on two recently released datasets, i.e., Newsroom and Bytecup.

**1.3 Purpose of the project**

In this section, we review different encoder-decoder models for the neural abstractive text summarization. We will start with the basic RNN seq2seq framework and attention mechanism. Then, we will describe more advanced network structures that can handle different challenges in the text summarization, such as repetition and out-of-vocabulary (OOV) words. We will highlight various existing problems and proposed solutions. Encoders and decoders can be feed-forward networks, CNN or RNN. RNN architectures, especially long short term memory (LSTM) and gated recurrent unit (GRU), have been most widely adopted for seq2seq models. Showing the result is basic RNN seq2seq model with a bi-directional LSTM encoder and an LSTM decoder. The bidirectional LSTM is considered since it usually gives better document representations compared to a forward LSTM. To tackle the first two challenges, See et al. proposed a pointer-generator network that implicitly combines the abstraction with the extraction. proposed a training framework based on the actor-critic method, where the actor network is an attention-based seq2seq model, and the critic network consists of a maximum likelihood estimator and a global summary quality estimator that is used to distinguish the generated and ground-truth summaries via a neural network binary classifier. proposed a compression-paraphrase multi-step procedure, for abstractive text summarization, which first extracts salient sentences from documents and then rewrites them. In their model, they used an advantage actor-critic algorithm to optimize the sentence extractor for a better extraction strategy. Another way to improve the abstractive text summarization is to make use of the salient information from the extraction process. Hsu et al. proposed a unified framework that takes advantage of both extractive and abstractive summarization using a novel attention mechanism, which is a combination of the sentence-level attention (based on the extractive summarization and the word-level attention (based on the pointer-generator network, inspired by the intuition that words in less attended sentences should have lower attention scores. proposed a discourse-aware attention model which has a similar idea to that of a hierarchical attention model. Their model was applied to two large-scale datasets of scientific papers, i.e., arXiv and PubMed datasets. The proposed algorithm has boosted the performance of the pointer-generator network on CNN/Daily Mail dataset. Compared with sentence summarization, the abstractive summarization for very long documents has been relatively less investigated. Recently, attention based seq2seq models with pointing/copying mechanism have shown their power in summarizing long documents with 400 and 800 tokens. However, performance improvement primarily attributes to copying and repetition/redundancy avoiding techniques. For very long documents, we need to consider several important factors to generate high quality summaries, such as saliency, fluency, coherence and novelty. Usually, seq2seq models combined with the beam search decoding algorithm can generate fluent and human-readable sentences. In this section, we review models that aim to improve the performance of long document summarization from the perspective of saliency. In seq2seq models for long document summarization usually consists of an encoder with a hierarchical architecture which is used to capture the hierarchical structure of the source documents. The top-level salient information includes the important sentences, chunks of texts, sections, and paragraphs, while the lower-level salient information represents keywords. In this section, we review different strategies to train the seq2seq models for abstractive text summarization. As discussed in, there are two categories of training methodologies, i.e., word-level and sequence-level training.

Apart from a comprehensive literature survey and a detailed review of different techniques for network structures, training strategies and summary generations, we have also developed an open-source library, namely, NATS17, based on RNN seq2seq framework for abstractive text summarization. In this section, we first introduce the details of our implementations and then systematically experiment with different network elements and hyper-parameters on three public available datasets, i.e., CNN/Daily Mail, Newsroom, and Bytecup.

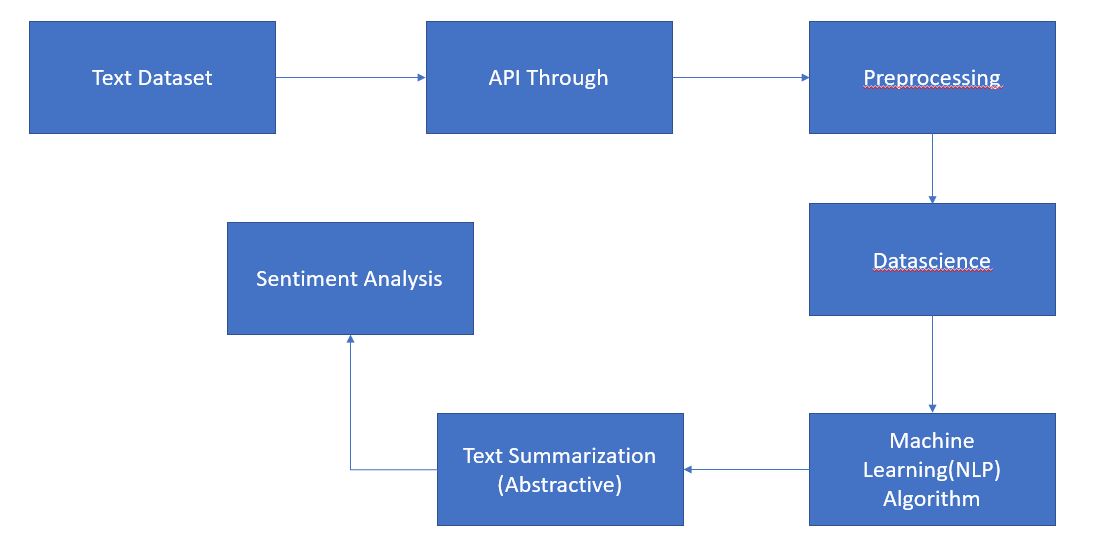
**Advantage:**

* The main Advantage is done optimize the sentence extractor for a better extraction strategy.
* We proposed a unified framework that takes advantage of both extractive and abstractive summarization using a novel attention mechanism.
* The proposed method performed well compared to all the existing methods.
* Execution time is less.
  1. **Outline of the Project**

Conference Room Booking and Management application is built for three end-users. They are,

1. **Employees** - Every employee of Nineleaps is given, privilege to book a room to carry out a meeting, and cancel the room.
2. **Project Manager** – is given with special privilege to book room for recurring meetings
3. **HR** – is given with many privileges other than booking a room and cancelling. They are,

* Blocking a Room
* Force Block a Room
* Add Rooms
* Add Buildings
  1. **Architecture**



**Fig: 1.1 Architecture**

**1.6 Project Modules**

**1. Pre-processing of input document:**

The phase of pre-processing involves chopping the paragraph into words. This phase involves four stages.

1. Sentence segmentation

2. Tokenization

3. Stop word Removal

4. Stemming

In each stage the document undergoes different changes. The changes are explained below

**1.1 Sentence Segmentation of paragraph in the document**

Sentence Segmentation is the process of breaking down/segmentation the given text document into sentences al. In this system sentence is segmented by identifying the boundary of sentence which ends with period symbol (.), question mark (?), exclamatory mark (!) and the total number of sentences present in the document are also identified.

**1.2 Tokenization of segmented sentences**

Tokenization is the process of breaking down the sentences into words. Tokenization is done by identifying the spaces ( ), comma (,) and special symbols between the words. In this process frequency of each word is calculated and stored for further processing.

**1.3 Stop Word Removal from the list of words**

Stop words are the words that do carry as important meaning as by keywords. These words are identified by supplying a list of words with less importance to the system. The system compares these stop words with the tokenized words obtained from previous phase. These stop words are then disposed as they can interfere and influence the summary that will be generated at the end.

**1.4 Stemming**

A word can be found in different forms in the same document. These words have to be converted to their root form for simplicity. This process is known as Stemming. An algorithm is used to transform words to their root forms. In this system, Porter’s stemmer method is used to turn a word into its root form using a predefined suffix list. Finally, frequency of each is word is calculated a retained for next phase.

**2. Sentence scoring**

After module 1 the input document is segmented into collection of words in which each word has its individual frequency. In module 2 the sentences are ranked based on seven important features:

1. Frequency

2. Sentence Position

3. Cue words

4. Similarity with the Title.

5. Sentence length.

6. Proper noun.

7. Sentence reduction.

**2.1 Frequency**

Frequency is the number of times a word occurs in a document. If a word’s frequency in a document is high, then it can be said that this word has a significant effect on the content of the document. Salient sentences/words are those sentences/words that occur repeatedly. The frequently occurring word increases the score of sentences they are in. The most common measure widely used to calculate the word frequency is TF (Term frequency) IDF (Inverse document frequency). The total frequency value of a sentence is calculated by summing up the frequency of every word in the document.

**2.2 Sentence Position Value**

It depends on our requirement whether important sentences are located at certain position in text or in paragraph. Sentences in the beginning define the theme of the document whereas sentences in the end conclude or summarize the document.

The positional value of a sentence is calculated by assigning the highest score value to the first sentence and the last sentence of the document. Second highest score value is assigned to the second sentence from starting and second last sentence of the document. Remaining sentences are assigned a score value of zero.

**2.3 Cue Words**

Cue words are the important words in a document. These Cue words are given as input from the user. If a sentence contains these Cue words then score value one is assigned to the sentence, otherwise the score value of the sentence will be zero.

**2.4 Similarity with the Title**

The words in the title and heading of a document that reappear in sentences are directly related to summarization. These words are considered for summarization as the have some extra weight in them. If a sentence contains words in title and header then score value one is assigned to that sentence, otherwise score value is zero for the sentence.

**2.5 Sentence length**

The length of the sentence resembles the importance of sentence in summarization. Generally, sentences that are very long and very short are not suitable for summary. Sentences that are very long will have unnecessary information which is not useful for summarization of document. Whereas, sentences that are too short do not give much of information about the document.

**2.6 Proper Noun**

Proper nouns play an important role in summarization. It gives information regarding, to whom or to what the author is referring. Roles played by individuals or locations description will be different more number of times in a document.

**2.7 Sentence reduction**

Sentence reduction is the method of removing irrelevant phrases like prepositional phrases, clauses, to infinitives, or gerunds from sentences. The goal is to identify less important phrases in a sentence using reduction decisions. The reduction decisions are based on syntactic knowledge, context, and probabilities computed from corpus analysis.

The final score is a Linear Combination of frequency, Sentence positional value, Cue Words, Similarity with the title of the document, Sentence length and Proper noun.

**3. Sentence Ranking**

After each sentence is scored they are arranged in descending order of their score value i.e. the sentence whose score value is highest is in top position and the sentence whose score value is lowest is in bottom position

**4. Summary Extraction**

After ranking the sentences based on their total score the summary is produced selecting certain number of top ranked sentences where the number of sentences required is provided by the user. For the reader’s convenience, the selected sentences in the summary are reordered according to their original positions in the document.

**CHAPTER – 2**

**DISCRIPTION OF THE ORGANIZATION AND DEPARTMENT**

**2.1 Description of the Organization**

Anspro Technologies is a Bangalore based software development company with vast industry experience in various domains, services & product lines. We utilize our vast experience and expertise in developing various software solutions in accordance with our client’s business and job requirements.

Anspro Technologies provides cost-effective, convenient and easy-to-manage software solutions services.

We serve our clients with cost efficient software applications that helps them to grow their business. Anspro Technologies offers one stop solutions to our customers for their web designing, web application development & web hosting requirements. We provide e-learning applications, which have advanced features and rich graphical interface. Our e-learning applications are best suited for educational institutions, training institutes for providing distant education and training purposes. Our customized billing and accounting tool is suitable for any departmental stores as well as for small scale industries.

We believe that technologies and ideas, are more than anything else to challenge the world and grow. However it’s not only the technologies we use, but how we integrate them, that counts. We understand that to integrate technologies requires the right people, and we have specialist individual teams of experts on board who provide pre-sales, post sales, project implementation and support.

**2.2 Description of Department of the Organization**

We believe that technologies and ideas, are more than anything else to challenge the world and grow. However it’s not only the technologies we use, but how we integrate them, that counts. We understand that to integrate technologies requires the right people, and we have specialist individual teams of experts on board who provide pre-sales, post sales, project implementation and support.

In order to sustain the productivity of any organization, it is necessary to automate the biometric time attendance system management. This is because manual attendance punching and related calculation leads to time and cost consumption.

Smart Card Solutions post-sales installation and support teams consist of professionals who are regularly certified to provide support for key brands. Many of our clients request comprehensive maintenance contracts with Anspro Technologies to ensure that their critical networks (hardware or software) are supported. These contracts range from traditional warranty support, to maintenance during office hours, to 24X7 critical support.

As a secure identity solutions and contactless smart card technology for physical access control, SMART Attendance is selected more than any other brand in the convergence of physical and logical access control. In addition, the company develops and markets ID components, products and services typically for organizations and education centres, corporate access control, supply chain management and various industrial solutions.

"Android based SMART Attendance System, your Student's safety and attendance at school and collage !!! " In order to sustain the productivity of any organization and advanced of technology, it is necessary to automate the attendance system management. This is because manual attendance punching and related calculation leads to time and cost consumption.

Smart Card Solutions post-sales installation and support teams consist of professionals who are regularly certified to provide support for key brands. Many of our clients request comprehensive maintenance contracts with SMART Attendance System to ensure that their critical networks (hardware or software) are supported. These contracts range from traditional warranty support, to maintenance during office hours, to 24X7 critical support.

**Services of Anspro Technologies**

SMART School Management System is a complete school management software. This online school management system is also a powerful attendance management system. With this attendance software, student and teacher attendance becomes very easy to capture and maintain. The attendance management process of this attendance software can be integrated with biometric and access card system as well. Reports about absent students or those reporting late can be generated and even a notification can be sent to their parents with this attendance management software. Thus, this powerful attendance management software provides parents with first-hand information about their wards bunking or genuinely taking a day off from school.

The attendance management module can also be used to view attendance reports. While students and parents can view only the concerned student's attendance, teachers have access to the entire class attendance. Use SMART - School Management System for easy school attendance management and realize other benefits of this powerful school attendance system. We firmly believe that technology, more than anything else is the key competitive differentiator today. However it's not only what technology you use, but how you integrate it that counts. We understand that to integrate technology requires the right people, and we have specialist individual teams of experts on board who provide pre-sales, post sales, project implementation and support.

**At School**



Assuming the busy world, Parents always have been at the worrying edge concerning about their kids en-route to school. Moreover, the school holds the responsibility for safe transport of students to and from their locations. The use of RFID helps not only the parents but also the School and brings assured arrival of the precises. In order to sustain the productivity of any organization, it is necessary to automate the biometric time attendance system management. This is because manual attendance punching and related calculation leads to time and cost consumption.

**The Solution**



Our unique application is that while the student enters the school a SMS will be sent to their Parents Mobile No., as same they will receive a SMS about the student departure from School on leaving the premises.

**ID Card Based**



Smart Card Solutions post-sales installation and support teams consist of professionals who are regularly certified to provide support for key brands. Many of our clients request comprehensive maintenance contracts with SMART to ensure that their critical networks (hardware or software) are supported. These contracts range from traditional warranty support, to maintenance during office hours, to 24X7 critical support.

**Fingerprint Based**



All the students/Staffs fingerprint impression will be recorded by a Biometric Machine. While enter/exit, pupil has to swipe their finger on the Biometric readers, the name will be displayed and the data has been collected and will be dispatched via SMS server. It takes just 2 to 3 seconds to read the recorded impression of the fingerprint. Smart Card Solutions post-sales installation and support teams consist of professionals who are regularly certified to provide support for key brands. Many of our clients request comprehensive maintenance contracts with SMART to ensure that their critical networks (hardware or software) are supported. These contracts range from traditional warranty support, to maintenance during office hours, to 24X7 critical support.

Backend all the readers will be connected via LAN and the data will upload to a computer. Now the SMS server dispatches all the data to corresponding mobile nos.

**On Road**



Consider one of our school bus which stops at 5 places to collect and dispatch students. Once the bus reaches the First STOP, the parents residing at the SECOND STOP will receiving a SMS saying " The School Bus NO 1 has reached the STOP 1, be ready at stop to receive your kid" DEMO SCHOOL and so on it will continuous till last stop. Backend all the readers will be connected via LAN and the data will upload to a computer. Now the SMS server dispatches all the data to corresponding mobile nos.

Advantages:

* Detailed report of arrival time for each BUS, each STOP.
* OVER SPEED Intimation of every BUS.
* One way listening (You can hear what people talking on bus?)
* Remote Engine Stop & Resume, Door Alarm (Optional)
* Help the parents to be there on the BUS STOP on-time.

**Finger Print Smart Access Card**

Future Smart Card Solutions post-sales installation and support teams consist of professionals who are regularly certified to provide support for key brands. Many of our clients request comprehensive maintenance contracts with SMART to ensure that their critical networks (hardware or software) are supported. These contracts range from traditional warranty support, to maintenance during office hours, to 24X7 critical support.

## ABOUT THE DEPARTMENT

**2.1 INTRODUCTION**

Anspro Technologies consists of the following main departments or functions:

* Production
* Research and Development (often abbreviated to R&D)
* Purchasing
* Marketing (including the selling function)
* Human Resource Management
* Accounting and Finance.

### 2.2 THE PRODUCTION FUNCTION

The Production function undertakes the activities necessary to provide the organization’s products or services. Its main responsibilities are:

* Production planning and scheduling
* Control and supervision of the production workforce
* Managing product quality (including process control and monitoring
* Maintenance of plant and equipment
* Control of inventory
* Deciding the best production methods and factory layout.

Close collaboration will usually be necessary between Production and various other functions within the organization, for example:

* Research and Development, concerning the implications of product design for production methods and cost
* Marketing, concerning desired product functionality, appearance, quality, durability and so on

Finance, concerning the availability of funds for purchase of new equipment and the acceptability of inventory levels.

* Human Resource Management, concerning staff motivation implications of job design and production methods.

#### 2.2.1 SERVICE ORGANIZATIONS

The principles of good management in a manufacturing environment also apply in organizations that provide services (rather than manufacture products), service businesses, such as banking and professional firms of accountants and solicitors, do have a number of distinctive features which have implications for how they are managed.

* Services are less easily standardized than manufactured products and so service quality tends to be more variable. This makes human resource management and motivation more critical.
* Services are often intangible and multi-dimensional what exactly is the ‘service’ being offered by a bank, a private hospital or educational establishment? This can make attracting customers more difficult as it often depends on promoting an intangible item.
* Manufactured products, services cannot be stored, but must be consumed as they are produced or they are wasted. Creates additional problems matching productive capacity with customer demand. This is reflected in, for example, the common practice of commercial airlines offering very cheap flights based on marginal cost to fill empty seats a plane flying empty to New York is a service provided but wasted!
* The cost of individual services is often also problematic, as the cost structure of many service businesses is such that costs are often shared among different services. This makes, among other things, pricing and the analysis of profitability of different services more difficult than with most manufactured goods

### 2.3 THE RESEARCH AND DEVELOPMENT FUNCTION

The Research and Development (R&D) function is concerned with developing new products or processes and improving existing products/processes. R&D activities must be closely coordinated with the organization’s marketing activities to ensure that the organization is providing exactly what its customers want in the most efficient, effective and economical way.

### 2.4 THE PURCHASING FUNCTION

The Purchasing function is concerned with acquiring goods and services for use by the organization. These will include, for example, raw materials and components for manufacturing and also production equipment. The responsibilities of this function usually extend to buying goods and services for the entire organization (not just the Production function), including, for example, office equipment, furniture, computer equipment and stationery. In buying goods and services, purchasing managers must take into account a number of factors – collectively referred to as ‘the Purchasing Mix’, namely, Quantity, Quality, Price and Delivery.

* **Quantity:** Buying in large quantities can attract price discounts and prevent inventory running out. On the other hand, there are substantial costs involved in carrying a high level of inventory.
* **Quality:** A trade-off between price and quality in acquiring goods and services. Consequently, Production, R&D and Marketing Functions will need to be consulted to determine an acceptable level of quality which will depend on how important quality is as an attribute of the final product or service of the organization.
* **Price:** The purchasing manager will look for the best price deal when procuring goods and services, although price must be considered in conjunction with quality and supplier reliability, in order to achieve best value, rather than lowest price only.

**Delivery:** The time between placing an order and receiving the goods or services, the lead time, can be critical for production planning and scheduling and also has implications for inventory control. Suppliers must therefore be evaluated in terms of their reliability and capability for on time delivery. considered as making sure that the organization has the right amount, of the right quality, at the right price, in the right place at the right time.

### 2.5 THE MARKETING FUNCTION

Marketing is concerned with identifying and satisfying customers’ needs at the right price. Marketing involves researching what customers want and analyzing how the organization can satisfy these wants. Marketing activities range from the strategic, concerned with the choice of product markets to the operational, arranging sales promotions, producing literature such as product catalogues and brochures, placing advertisements in the appropriate media and so on. A fundamental activity in marketing is managing the Marketing Mix consisting of the 4Ps: Product, Price, Promotion and Place.

* **Product:** The right product in terms of benefits that customers value.
* **Price:** Setting the right price which is consistent with potential customers’ perception of the value offered by the product.
* **Promotion:** Promoting the product in a way which creates maximum customer awareness and persuades potential customers to make the decision to purchase the product.
* **Place:**Making the product available in the right place at the right time including choosing appropriate distribution channels.

A business enterprise must either have a lower price than its competitors, or a product that is in some way superior or both. A competitive strategy based on low price is known as a cost leadership strategy. A competitive strategy based on developing a superior product is known as a differentiation strategy.

#### 2.5.1 THE HISTORICAL EVOLUTION OF MARKETING

Three distinct eras in the history of advanced capitalist countries, such as the UK, which have affected the status, role and responsibilities of the Marketing function. These were:

* **The Production Era** (pre–1930). A period of time during which products (and services) were relatively scarce (thereby constraining consumer choice) and the most important function of business was that of production. Marketing, in so far as it existed, was considered the least important function.
* **The Sales Era** (1930–50). An era characterized by a shift in emphasis of business management from the production function to that of selling. With continued industrial development and innovations, many new consumer oriented products became available and a much more competitive selling environment resulted. This made it necessary to seek out customers and make significant use of advertising, promotion and personal selling.
* **The Marketing Era** (1950–present). Period marked another significant change in the attitude of senior management towards the status and responsibilities of marketing. This change, referred to by many writers as the [Marketing Concept,](about:blank#idp30692512) meant a departure from the previous concept of marketing as being the sales function of a business, to one where marketing had a much greater responsibility in total company policy formation and operation. Under the Marketing Concept, marketing was placed at the beginning of the process of determining the products which were needed by the market, the price at which they should be sold and the way in which they were to be distributed.

### 2.6 THE HUMAN RESOURCES FUNCTION

The Human Resources function is concerned with the following:

* Recruitment and selection. Ensuring that the right people are recruited to the right jobs.

Training and development. Enabling employees to carry out their responsibilities effectively and make use of their potential.

* Employee relations. Including negotiations over pay and conditions.
* Grievance procedures and disciplinary matters. Dealing with complaints from employees or from the employer.
* Health and Safety matters making sure employees work in a healthy and safe environment.
* Redundancy procedures administering a proper system that is seen to be fair to all concerned when deciding on redundancies and agreeing redundancy payments.

Organizations are dependent on their employees. Consequently, their recruitment and selection require careful management. In recent years, the Human Resources function has attained a more important status as there has developed an increasing need (especially in service organizations) to ‘get the most’ from employees, in terms of customer service, for the benefit of the organization.

### 2.7 THE ACCOUNTING AND FINANCE FUNCTION

The Accounting and Finance function is concerned with the following:

* Financial record keeping of transactions involving monetary inflows or outflows.
* Preparing financial statements (the income statement, balance sheet and cash flow statement) for reporting to external parties such as shareholders. The financial statements are also the starting point for calculating any tax due on business profits.
* Payroll administration Paying wages and salaries and maintaining appropriate income tax and national insurance records.
* Preparing management accounting information and analysis to help managers to plan, control and make decisions.

#### 2.7.1 THE ORGANIZATIONAL ENVIRONMENT

Organizations exist in an environment everything that surrounds the organization physically and socially. The constituents of the organization’s environment are likely to have an important impact on the management of the organization. An organization’s management must systematically analyze its environment in formulating plans to achieve organizational objectives. The major environmental factors impacting on an organization can be grouped under four headings: political/legal, economic, social/demographic and technological.

#### 2.7.2 ECONOMIC ENVIRONMENT

Economic variables such as inflation, interest rates, savings patterns, economic growth, exchange rates, the levels of taxation and government spending all influence the amount of money people have to spend. This is likely to have an impact on most organizations. Businesses will experience, for example, varying levels of demand for their products or services and charities will experience varying levels of donations, as the amount of money people have to spend fluctuates in response to variations in major economic variables.

**CHAPTER – 3**

**ROLES, RESPONSIBLILITIES AND ACTIVITIES CARRIED OUT**

**3.1 General Roles and Responsibilities of the Intern**

Being an Python Developer, there are many roles and responsibilities that needs to be followed. They are,

**Roles of an Intern**

* To build great contacts and network with like-minded people and professionals.
* To train your mind to work in an efficient and productive manner.
* Internships are one of the best ways of learning. Learning should never stop, to learn something new every day.
* To experience real working experience.
* To gain new skills, ranging from communication and writing skills to negotiation and cooperation skills
* Fulfill agreed upon time commitments.
* Conduct oneself in a responsible and professional manner.
* Discuss progress and engage in discussion of topics relevant to the operation and philosophical perspective of the office and functional area in general.

**Responsibility of an Intern**

* To develop a summarized news application
* To improvise the user experience by using the latest technologies.
* To build reusable code and libraries for future use.
* To ensure the responsiveness of the web application in both desktop and mobile view.
* To ensure the technical feasibility of API
* To handle all the validation in client side.
* Optimize application for maximum speed and scalability.
* Collaborate with other team members and clients.
* To ensure proper API calls with the server.

**3.2 Description of the activities carried out during Internship**

In addition to the internship project, before starting the internship, the intern formulates the internship activities and/or tasks that the organization providing the internship expects of the intern.

* Interns are expected to contribute to day-to-day work at the organization.
* Attending departmental meetings.
* Assisting a colleague with relevant tasks.
* Attending client visits
* Organizing part of a training course, workshop or lecture.
* Testing products or tools

**CHAPTER – 4**

**TECHNICAL AND PROFESSIONAL TAKE AWAYS OF THE INTERNSHIP**

**4.1 Technical take away of the Internship**

**PYTHON**

Python is an object-oriented programming language created by Guido Rossum in 1989. It is ideally designed for rapid prototyping of complex applications. It has interfaces to many OS system calls and libraries and is extensible to C or C++. Many large companies use the Python programming language include NASA, Google, YouTube, BitTorrent, etc.

Python is widely used in Artificial Intelligence, Natural Language Generation, Neural Networks and other advanced fields of Computer Science. Python had deep focus on code readability & this class will teach you python from basics.

Here python language used for IR sensor and HD camera

## Characteristics of Python

* It provides rich data types and easier to read syntax than any other programming languages
* It is a platform independent scripted language with full access to operating system API's
* Compared to other programming languages, it allows more run-time flexibility
* It includes the basic text manipulation facilities of Perl and Awk
* A module in Python may have one or more classes and free functions
* Libraries in Pythons are cross-platform compatible with Linux, MacIntosh, and Windows

**4.2 Professional take away of the Internship**

This internship has helped me to develop best-in-class technological solutions as well as gain soft skills to showcase myself in a more professional manner in the IT industry. We have also been exposed to new trending technologies which has helped me to fill the gap between my academics and business technology.

**Below are some of Objectives of Industrial Internship which I achieved**

* Reduce the gap between the academic learning and Industry experience.
* Core and advanced features of each technology, covered in interactive classroom sessions
* Topic based Assignments has developed my programming skills
* Effectively utilizing a new software tool to complete a task
* Maintaining and troubleshooting technology
* Performing effective and informative user testing
* Selecting appropriate technologies
* Acquiring and evaluating information

**Project Implementation Process**

* **Step 1**: Typically I undergo Internship on particular technology platforms of their choice.
* **Step 2**: Thereafter I would be assigned a Team Leader and expected to execute a live project work under the guidance of a Project manager/analyst.
* **Step 3**: At the end of the program each trainee would need to submit a ‘Project Report’ of the work done, and would also be required to make a presentation.
* **Step 4**: All the students will be provided certificate after Internship after an evaluation.

**4.1 Learning Goals**

* **Exposure to corporate world**

The internship provides me an opportunity to enter into the corporate world where I can nurture and groom my skills for successful career. As software engineer I realize the importance of practical exposure, rather than just learning the academic subjects. By this internship I came to know the pace at which currently the industries are working on. Internship represents a cross-over point between industry and university and career and also helps in planning our studies.

The experience gained during internship will indicate how should we structure our future studies, particularly, when it comes to deciding what aspects should focused on.

* **Enhancing communication skills**

Communication skills play a major role when it comes to express your ideas and thoughts and even to have a basic conversation with your colleagues. My stay has contributed to my communication skills, but I would like to pay more attention to it in the future. I can come across as reserved and uncertain. To contribute more to projects and to progress faster, I want to learn to make a more confident impression and to express my ideas and opinions more certain.

* **The use of skills and knowledge gained in the university**

It is difficult to say what skills and knowledge gained in my study I could put in practice in my internship. I can think of the use of the experience from my course of study in M.Tech, such as practicing in labs, where I was taught some basics on data collection, data processing and setting-up research projects and also, how to find a solution to the given problem or program with maintaining time constrain. This is reasonable and I have seen that within research projects you acquire the skills and knowledge needed.

* **Skills and knowledge that might be improved to work in a professional environment**

Although you learn and develop the necessary skills and knowledge while working in an organization, there are several things that I could improve already. I did not have totally clear what activities I could have done to reach my learning goals. Therefore during my stay I had some difficulties to determine tasks that I could carry out.

Other aspects to which I want to pay attention in general are: defining a clear research question and determine what data collection and analysis is suitable. I often have the tendency to concentrate more on data collection activities. Also in the internship I have seen that it is important to have your research clear, because it guides you in the process. In addition to acquiring technical knowledge it is equally important to have vision of adopting the soft (communication) skills. My presence in internship clearly improved my non-technical skills, initially I know I am better enough with my soft skills, but when I joined my internship, I came to there is still scoop for improvement. Undoubtedly, I had worked on those, and I wish the internship put a magic wind on me.

* **Working in team(team Spirit)**

In course of internship, I have been asked to work in team. Different fun, non-technical and technical activities play a major role because they contribute to a better understanding among the team members. Group discussion is one of the vital act. It permits that information can be passed and topics can be discussed in more depth. It is also a way to make each other enthusiastic and it stimulates to put things into action. Through the internship I learned about conservation and management, but I want to learn more about it. Especially the group discussions and non-technical are interesting topics.

* **Organizing projects**

Within the internship I did a lot of fieldwork. Because of this I have seen of what aspects you have to think while organizing a project (collecting requirements, collection of data, how to meet requirement)

Furthermore I have learned how an education program can be set up and what things have to be taken into account. It is important determine the knowledge present and to adjust the program to each group. It is of importance to convey an objective and supported message taking the viewpoints of people into account. I became also aware that local people have a lot of knowledge that could help in research and conservation.

Before the internship I did not have any experience in an industrial world and I had no idea how my performance will be. In the future I would like to utilize the knowledge and experience I have gained in internship to my professional carrier and even to my personal activities.

* **Research methodologies (field methods/methods to analyze data)**

I increased my knowledge on methodologies used to develop project and the other non-technical things which helps to increase the pace, quality and impact of project. As it’s known there are various methodologies available, choosing a methodology appropriate for your work is question of interest.

There was one goal that I could not reach in this internship. I planned to work on a project in more depth. This means, be part of the whole project from the preparation till the data analysis and interpretation of the results. Unfortunately, the due to the limited internship duration, I could work on some of the module. Therefore a new plan of activities had to be made. I planned to help in the data analysis. The participation in my internship period and there was no time left to do analyses. I would have liked to practice more within my internship, but at the end I only learned about data analyses from the literature.

* **The influence on future career plans**

Before joining M.Tech, I had doubt where my future will lead. The thing to glad is I got an opportunity to have an internship during my academics. I was so excited for this since the beginning of my course and the excitement picked up its speed as time for internship comes near. Finally the time appear when I actually have to admit to some corporate level where I can groom myself both in technical and non-technical aspects. The internship fulfills those expectations.

Through this internship, I have seen what elements of my career I like and I got enthusiastic to Work hardly and heartily on it. I have found out that I should continue to do work on my technical and non-technical programs even after the completion of internship. By doing this, I think, I can and will have a better and satisfactory outcome of my life.

In general, It was a wonderful and learning experience for me in this internship and also while working on a project assigned. This project took me through the various phases of project development and gave me a real insight into the world of software engineering.

The joy of working and the thrill involved while tackling the various problems and challenges gave me a feel of developers industry.

It was due to this project I came to know how professional software’s are designed. I enjoyed each and every bit of work I had put into this project.

**4.2 Non-Technical Skills**

Below are the non-technical skills which I have learned and practiced during my internship

* **Organizational Behavior**

There are several office manners that need to be addressed at this level where we plan to enter the IT industry:

Manners and Behaviours professionals should not exhibit

* Inappropriate Welcome
* Poor Listening
* Inconsiderate of Office Space
* Poor Telephone Behavior
* Poor Dress and Grooming
* Snooping
* Disregard of Others Time
* Inappropriate Behaviour while Working
* **Telephone Etiquette**
* Answering the telephone/greeting
* Placing callers on hold
* Returning phone calls
* Closing the conversation
* **Proper telephone language**

Telephone techniques are built from a few basic rules and principles. In fact, telephone etiquette can be summarized in one word: COURTESY. Unfortunately, courtesy is not something people are used to being shown routinely in the business world. If the caller is a potential customer and you are courteous to him, you have an excellent chance of gaining a new customer. If he is an existing customer, you’ll keep him for life!

* **Verbal Communication**

NATO Phonetics

Vocal Skills - Tone, Inflection, Pitch, Rate and Volume

**Voice** reflects attitude. Even if the words are cor­rect and intended to be polite, tone could imply the oppo­site. Voice is made up of five dis­tinct ele­ments: tone, inflec­tion, pitch, rate and vol­ume. Your voice contains specific percentages of each element that makes it uniquely yours. However, there is a best practice range within which your voice sounds confi­dent and most importantly professional.

**Tone** is the most important vocal skill in great telephone etiquette. Tone expresses your over­all attitude and lets the person you are communicating with know how you feel about them.

**Inflection** refers to the way you highlight certain words and phrases. When used well, a representative can use inflection to stress the importance of certain words and keep the caller engaged and on track.

**Pitch** refers to how high or low your voice sounds. Generally higher pitched voices sound abrasive, while low deeper voices tend to be more soothing.

**Rate** refers to the speed and cadence of your voice. speak slowly and clearly, and/or adjust their rate to match the customers.

**Volume** refers to how soft or loud you speak. Volume is the easiest element to control. However, many people are unaware that they speak too softly or too loudly and will need to be coached to use an appropriate level when taking a call.

* **Presentation Skills**

Chances are that you'll sometimes have to speak in public as part of your role. While this can seem intimidating, the benefits of being able to speak well outweigh any perceived fears. To become a better speaker, use the following strategies:

* Plan appropriately.
* Practice.
* Engage with your audience.
* Pay attention to body language.
* Think positively.
* Cope with your nerves.
* Watch recordings of your speeches.

If you speak well in public, it can help you get a job or promotion, raise awareness for your team or organization, and educate others. The more you push yourself to speak in front of others, the better you'll become, and the more confidence you'll have.

* **Effective Public Speaking**

Some proven tips for effective public speaking are:

* Know your material
* Rehearse out loud with all equipment
* Know the audience
* Arriving early at the specified place
* Beginning by addressing the audience
* Realize that people want you to succeed
* Gain experience
* Concentrate on the message
* **Written Communication**

**E-mail Etiquette**

* Only discuss public matters
* Briefly introduce yourself.
* Be careful with confidential information
* Use exclamation points sparingly
* Respond in a timely manner
* Refrain from sending one-liners
* Avoid using shortcuts to real words, emoticons, jargon or slang.
* Be clear in your subject line.
* Your subject line must match the message
* Provide a warning when sending large attachments
* Send or copy others only on a need to know basis.
* Pick up the phone.
* Maintain privacy.
* Keep it short and get to the point
* Know your audience.
* Always include a signature.
* Only use an auto-responder when necessary.
* **Introduction to IT Project Management for time management and better utilization of resources**

Project management is no small task. It has a definite beginning and end, and is not a continuous process. Project management uses various tools to measure progress and track project tasks. Projects need ad-hoc resources, as opposed to businesses that have dedicated full-time positions.

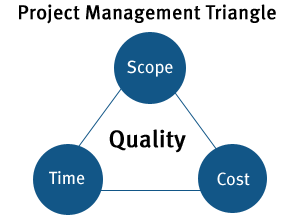
IT project management is a sub-discipline of project management in which information technology projects are planned, monitored and controlled.

* **Project Management Methodology**

Project management methodologies consist of four to five process groups, and a control system. Regardless of the methodology or terminology used, project management uses the same basic processes. Process groups typically include:

* Initiation of project
* Planning & Design
* Coding & Execution
* Monitoring & Controlling
* Closing
* **What Is Project Management**

Project management is a process that involves several things including planning, putting the project plan into action, and measuring progress and performance.



**Fig 4.1: Project Constraints**

The biggest jobs in project management is to balance the triple constraints while meeting or exceeding the expectations of your stakeholders. Project constraints are also considered to be somewhat mutually exclusive. In the project management triangle, it is assumed that making a change to one constraint will affect one or both of the others. For example, increasing the scope of the project is likely to require more time and money.

* **Project Constraints**
* Time
* Money
* Quality

**CONCLUSION**

**This internship was very interesting to me, as I got an opportunity to learn in a different and more importantly in a corporate environment. During this internship I have learned many things including from enlightening my previous technical skills to adopting a new programming techniques, creating documentation, doing research, performing in team, and from my usual personality to corporate personality, where I groomed myself and my structured personality, communication skills, writing skills, presentation skills During the course of internship I had worked on project idea, I have skilled with how to take on project development. The overall internship was so useful improving my professional and personal life. This is the result of hard, serious and careful working process.**

**APPENDIX**

**Screenshots**

